

1. Claims 10, 14-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 10 depends from claim 1 which recites that the fibers of the middle layers are in a "loose array" but claim 10 recites that the fibers, pellets and matrix material form a sheet. it is not clear how a loose array can also be formed into a sheet wherein the fibers would necessarily be fixed in the matrix material. Similar issues are also present in claims 14-16. Further, in claim 17, it appears that there is a typographical error in line 4, wherein "ina" should be "in a". also, in claim 14, it is assumed that the claim intends to depend from claim 10, but it is not fully clear due to the way it is written.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2, 6-7, 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Thomas, U.S. Patent No. 5,736,474. Thomas discloses a ballistic panel comprising two woven layers 18 and 20 and a middle layer 22 comprising a loose array of nonwoven random fibers and a plurality of pellets. More than one of the pellet containing layers can be provided. See col. 6, lines 62-64. The fibers can be aramid fibers, (Kevlar). See col. 7, lines 14-45. The layers are needled punched to combine them which corresponds to the claimed transverse binding.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-7, 9-16 rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas, U.S. Patent No. 5,736,474 in view of Harpell et al, U.S. Patent No. 4,748,064. Thomas discloses a ballistic panel comprising two woven layers 18 and 20 and a middle layer 22 comprising a loose array of nonwoven random fibers and a plurality of pellets. More than one of the pellet containing layers can be provided. See col. 6, lines 62-64. The fibers can be aramid fibers, (Kevlar). See col. 7, lines 14-45. The layers are needed punched to combine them which corresponds to the claimed transverse binding.

6. Thomas differs from the claimed invention because it does not disclose employing a loose array of parallel nonwoven fibers and does not teach the claimed flexible matrix material or the claimed pellet size. However, with regard to the claimed pellet size, since Thomas teaches providing the pellets so that they are sized and shaped to provide for expedient transfer of energy from one shape to another, it would have been obvious to have select the particular sizes and shapes which produced the most efficient energy transfer. See col. 7, lines 55 - col. 8, line 38.

7. With regard to providing parallel fibers rather than random fibers, or in combination with random fibers and to providing a flexible matrix material, Harpell teaches that in forming ballistic panels, that the fibers may be disposed in different

layers in a variety of configurations, including parallel, random, woven and knitted. See col. 7, lines 51-col. 8, line 3; col. 4, lines 1-10, lines 43-60. Therefore, it would have been obvious to one of ordinary skill in the art to have employed other known fiber configurations in the structure of Thomas in order to arrive at a ballistic material having optimum protective properties. Harpell further teaches providing a flexible coating matrix such as a silicone elastomer to the fibers employed in such ballistic panels in order to further enhance the ballistic resistance of the panel. See col. 6, lines 1-45. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed a flexible matrix as taught by Harpell in order to increase the ballistic resistance of the ballistic panel of Thomas. Harpell further teaches that the layers can be combined by crosslinking the coating by means of heat. The coating would further correspond to an adhesive and thus meet the limitations of claim 13. See col. 8, lines 11-31. Therefore, it would have been obvious to have employed crosslinking and adhesive bonding of the layers as taught by Harpell to bond the layers of Thomas in order to form a strong and coherent structure.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas, U.S. Patent No. 5,736,474 as applied to claims above, and further in view of GB 1081464. Thomas differs from the claimed invention because it does not teach employing natural fibers. However, GB '464 teaches employing natural and synthetic fibers in forming ballistic resistant panels. See page 2, line 51 – 71. Therefore, it would have been obvious to have employed other known and useful type of fibers in the structure of Thomas, in view of their art recognized suitability for this purpose.

Art Unit: 1782

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth M. Cole whose telephone number is (571) 272-1475. The examiner may be reached between 6:30 AM and 6:00 PM Monday through Wednesday, and 6:30 AM and 2 PM on Thursday.

The examiner's supervisor Rena Dye may be reached at (571) 272-3186.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

The fax number for all official faxes is (571) 273-8300.

/Elizabeth M. Cole/
Primary Examiner, Art Unit 1782

e.m.c